

Application No. 09/841,255

Double Patenting Over 09/433,202

The Examiner provisionally rejected claims 1-4, 6, 15 and 23-25 for obviousness-type double patenting over claims 1, 3, 4, 14-18, 24 and 26 of copending application 09/433,202. Applicants will consider filing a terminal disclaimer when the claims have been found otherwise allowable.

Double Patenting Over Patent Application Publication 2001/0000912

The Examiner provisionally rejected claims 1-4 and 6-8 for obviousness-type double patenting over claims 1-8 of Patent Application Publication 2001/0000912. Applicants will consider the filing of a terminal disclaimer when the claims are found otherwise allowable.

Double Patenting Over U.S. Patent 6,290,735

The Examiner rejected claims 1, 4, 6, 15 and 25 for obviousness-type double patenting over claims 1, 2, 4-8 and 11 of U.S. Patent 6,290,735. Applicants will consider filing a terminal disclaimer when the claims have been found otherwise allowable.

Rejections Under 35 U.S.C. §102 Over EP 554,908

The Examiner rejected claims 15 and 25 under 35 U.S.C. §102(b) as being anticipated by EP 0 554 908B to Garg (the Garg EP patent). The Examiner noted that the Garg EP patent asserted to disclose alpha aluminum oxide with a particle size range from 20 to 50 nm diameters and the substantial absence of particles larger than 100 nm. Applicants believe that there are inconsistencies in the Garg EP patent. Applicants respectfully request reconsideration of the rejections over the Garg EP patent based on the following comments.

The Garg EP patent asserts to disclose alpha aluminum oxide particles with widths from about 20 to about 50 nm with less than about 5 percent with widths greater than about 100 nm. See column 5, lines 35-44. Particles with these properties are not within Applicants' claim since the claim indicates that effectively no particles, not a few percent, have a diameter greater than about 5 times the average diameter.

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In further support of the rejection, the Examiner pointed to example 2. At column 9, lines 11-15, the Garg EP patent states "Transmission electron microscopy of this product, (Figure 1 of the Drawings), showed that substantially all of the particles had widths within the range of 20-50 nm and there was a substantial absence of particles over 100 nm." A visual review of Figure 1, however, reveals many particles with diameters under 20 nm in size and one or two dozen particles with diameters larger than 100 nm with at least a couple of particles having a diameter of about 200 nm. It is unclear what a "substantial absence" is intended to mean, but it does not mean "effectively no particles" as disclosed and claimed by Applicants.

The average particle size in Figure 1 of the Garg EP patent is roughly 35 nm. Thus, five times this value would be 165 nm. There are several particles within the micrograph larger than this. Thus, the Garg EP patent falls significantly short of disclosing Applicants' claimed invention. The Examiner failed to establish a prima facie case of anticipation because the Garg EP patent does not disclose all the elements of Applicants' claimed invention. Claims 15 and 25 are not anticipated by the Garg patent. Applicants respectfully request withdrawal of the rejection of claims 15 and 25 under 35 U.S.C. §102(b) as being anticipated by the Garg EP patent.

#### Rejections Under 35 U.S.C. §102 Over Gutsche

The Examiner rejected claims 1, 2, 4, 6-8, 15, 23 and 25 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 4,011,099 to Gutsche (the Gutsche patent). The Examiner asserts that the Gutsche patent discloses silica with all of the particles having a size within 25-30 nm. Applicants respectfully request reconsideration of the anticipation rejection over the Gutsche patent based on the following comments.

The Gutsche patent described the polishing of alpha alumina (aluminum oxide) using commercial suspensions of colloidal silica. There is no discussion of the characterization of the commercial silica. The Examiner makes the unsubstantiated assertion that the statement at column 3, lines 44-45 of "a particle size of 250 - 300 Angstroms" implies that all the particles are within this

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range. The only reasonable interpretation of this statement is that the average particle size is between 250 and 300 angstroms. Applicants do not believe that the Gutsche patent can be interpreted reasonably as indicated by the Examiner. Therefore, the Examiner has failed to make a prima facie case for anticipation because the Gutsche patent fails to disclose all of the elements of Applicants' claimed invention. Applicants respectfully request withdrawal of the rejection of claims 1, 2, 4, 6-8, 15, 23 and 25 under 35 U.S.C. §102(b) as being anticipated by the Gutsche patent.

Rejections Under 35 U.S.C. §102 Over Shimizu et al.

The Examiner rejected claims 1, 4, 6, 9, 10, 12-15 and 25 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 4,842,837 to Shimizu et al. (the Shimizu patent). The Examiner cited the Shimizu patent for disclosing uniform silicon oxide particles. In particular, the Examiner noted that the Shimizu patent disclosed monodispersed silica. Applicants respectfully request reconsideration of the rejections over the Shimizu patent in view of the following analysis.

In the abstract, the Shimizu patent indicates that the particles are "highly monodispersed." However, highly is a relative terms that does not quantify the degree of uniformity. There is no direct indication of the degree of uniformity of the silicon oxide particles. Therefore, the only way that the Shimizu patent can anticipate Applicants' claimed invention is through inherency. However, the Examiner has not presented a prima facie case for anticipation by inherency. Therefore, Applicants respectfully request withdrawal of the rejection of claims 1, 4, 6, 9, 10, 12-15 and 25 under 35 U.S.C. §102(b) as being anticipated by the Shimizu patent.

Rejections Under 35 U.S.C. §102(b) Over the Rostoker '194 Patent And the Rostoker '715 Patent

The Examiner rejected claims 1, 2, 4, 6, 7, 9, 15, 23 and 25 under 35 U.S.C. §102(b) over the Rostoker '194 patent. Similarly, the Examiner rejected claims 1, 2, 4, 6, 7, 9, 15, 23 and 25 under 35 U.S.C. §102(b) [sic 102(e)] over the Rostoker '715 patent. In particular, the Examiner cited the Rostoker '715 patent for disclosing dispersions of alumina or silica particles. Specifically, the Examiner points to the prophetic Examples of the Rostoker patents in support of the rejection.

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The Rostoker '194 patent and the Rostoker '715 patent contain equivalent disclosure from the perspective of these rejections and are, therefore, considered together. Applicants respectfully request reconsideration of the rejection based on the following. A similar Rostoker patent is discussed in detail in the attached Declaration of Dr. Singh. Dr. Singh's analysis supports Applicants' present position.

Based on the Examiner's clear explanation of the basis for the interpretation of the Rostoker patent, Applicants can describe in detail why the Examiner's proposed interpretation is inconsistent with the Rostoker patents. There is complete agreement on the definition of X as the average particle size and  $Y=PX/100$ , with dimensions of distance. Y is clearly related to the distribution of particle sizes. The disagreement, however, arises with respect to the relationship of Y to the distribution.

The Examiner asserts that the distribution of particle sizes is  $X \pm PX/100$  where ALL of the particles are within the range. This cannot be true for at least two reasons. First, the Rostoker patent explicitly explains that "Y" is related to a quantity called a "quality factor" "Q", which is calculated directly from the distribution itself. Column 6, lines 20-27. Q is stated to be dimensionless (line 27). But at the same time Q is stated to be inversely related to Y (line 20), i.e., Q is directly proportional to  $1/Y$ . The proportionality factor is never defined, which may imply that  $Q=1/Y$ , implying dimensions of 1/distance. According to Rostoker, "Q" can be calculated as the concentration of particles at the desired size 'X', divided by the range of sizes of particles at 3 bd (decibels) lower than 'X'."

Thus, the value of Y flows from the value of Q which is calculated from the distribution. Y does not define the distribution directly according to the explicit definitions in the Rostoker '715 patent. The distribution stated by the Examiner  $X \pm PX/100$  is inconsistent with the definition of Y in terms of Q. The Examiner's definition of the distribution is stated NOWHERE in the Rostoker patents. This is true regardless of whether "controlled" is a noun or a verb since

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"controlled" not a term of art meaning the distribution defined by the Examiner. If it is within the Examiner's personal knowledge that "controlled" is a term of art meaning the distribution indicated by the Examiner, Applicants respectfully request documentary or affidavit support for this assertion.

The problem with a clear understanding of Y is that the Rostoker patent indicates that Q is dimensionless but equal to  $1/Y$ . This is internally inconsistent. Also, the definition of Q is unclear. Specifically, Q is calculated as a concentration divided by a size, which would give units of  $1/\text{distance}^4$ , which cannot be reconciled with either Q being dimensionless or with  $Q=1/Y$ . Furthermore, the meaning of "the range of particle sizes at 3 db (decibels) lower than 'X'" is does not clarify the meaning. Assuming that the decibels relate to a ratio of lengths rather than powers,  $3 \text{ db} = 10 \log_{10} X'/X$ . This would yield a distance of  $X' = X/2$  corresponding to a range 3 db lower than X. Thus, Q would be a concentration in unspecified units divided by  $X/2$ , which would not seem to be a meaningful value. In conclusion, there is no way of unambiguously understanding the relationship of Y to the distribution of particle sizes.

Second, with respect to why the Examiner's view of the distribution cannot be correct, the Rostoker '715 patent indicates that the distribution is Gaussian (column 6, line 16). There is no basis for the Examiner's assertion that the distribution  $X \pm XP/100$  would fit a Gaussian distribution,  $N(D) = A \exp\{-[(D-X)/2B]^2\}$ . Gaussian distributions do not have sharp cut-offs, but gradual cut offs. In fitting a particle size distribution curve to a Gaussian, it is clearly an imperfect fit since negative values of particle size are undefined. Similarly, the distributions clearly are not perfectly symmetric about the average. However, if one concentrates on the distribution for sizes larger than X, a reasonable fit may be possible in many case. Applicants particles formed under nonequilibrium conditions, however, do not have a Gaussian distribution of particle sizes. Nevertheless, a Gaussian distribution is completely inconsistent with  $X \pm XP/100$  containing ALL of the particles.

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As explained in detail in the Amendment of June 19, 2000, Applicants maintain that the Examiner has failed to establish prima facie anticipation and respectfully request the withdrawal of the rejection of claims 1, 3, 6-8, 15 and 23 under 35 U.S.C. §102(b) [sic 102(e)] over the Rostoker '715 patent and under 35 U.S.C. §102(b) over the Rostoker '194 patent.

Rejections Over EP 554 908 and Secondary References

The Examiner rejected claims 23 and 24 under 35 U.S.C. 103(a) as being unpatentable over the Garg EP patent in view of the Sandhu patent, the Rostoker '194 patent, the Rostoker '715 patent and the Gutsche patent. The Examiner cited the secondary references for disclosing aqueous and nonaqueous solutions for polishing compositions. However, the primary reference does not disclose particles with the claimed properties, as described above. Applicants respectfully request reconsideration of the rejection based on the above and the following comments.

As described above, the Garg EP patent does not establish a prima facie case of anticipation of Applicants' claimed invention. The secondary references do not make up for the deficiencies of the Garg EP patent. Therefore, the combined disclosures of the references fail to establish a prima facie case of obviousness of Applicants' claimed invention. Applicants respectfully request withdrawal of the rejections of claims 23 and 24 under 35 U.S.C. 103(a) as being unpatentable over the Garg EP patent in view of the Sandhu patent, the Rostoker '194 patent, the Rostoker '715 patent and the Gutsche patent.

Rejections Over Shimizu and Secondary References

The Examiner rejected claims 2, 3, 23 and 24 under 35 U.S.C. 103(a) as being unpatentable over the Shimizu patent in view of Sandhu et al., Rostoker, Rostoker et al. and Gutsche. The Examiner cited the secondary references for disclosing the use of liquids in polishing compositions. However, as discussed above, the primary reference does not establish a prima facie case of anticipation of Applicants' claimed invention because it fails to disclose all of

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the claimed elements. Applicants respectfully request reconsideration of the rejection based on the following and above comments.

As described in detail above, the Shimizu patent does not disclose particles with properties specified in Applicants' claims. The secondary references do not make up for the deficiencies of the Shimizu patent. Therefore, the combined disclosures of the cited references do not establish a *prima facie* case of obviousness of Applicants' claimed invention. Applicants respectfully request withdrawal of the rejection of claims 2, 3, 23 and 24 under 35 U.S.C. 103(a) as being unpatentable over the Shimizu patent in view of Sandhu et al., Rostoker, Rostoker et al. and Gutsche.

Rejections Over Rostoker or Rostoker et al.

The Examiner rejected claims 1, 2, 4, 6-9, 12, 15, 23 and 25 under 35 U.S.C. 103(a) as being unpatentable over the Rostoker '194 patent or the Rostoker '715 patent. The Examiner asserted that polishing with certain parameters was obvious to a person of ordinary skill in the art. However, the Rostoker '194 patent and the Rostoker '715 patent, taken alone or together, do not establish a *prima facie* case of obviousness because they do not teach or suggest particles with the properties specified in Applicants' claims. The deficiencies of the Rostoker '194 patent and the Rostoker '715 patent are described in detail above. The deficiencies of the Rostoker patents are further described in the attached Declaration of Dr. Singh. Applicants respectfully request withdrawal of the rejection of claims 1, 2, 4, 6-9, 12, 15, 23 and 25 under 35 U.S.C. 103(a) as being unpatentable over the Rostoker '194 patent or the Rostoker '715 patent.

Rejections Over Sandhu and Secondary References

The examiner rejected claims 1-4, 6, 15 and 23-25 under 35 U.S.C. 103(a) as being unpatentable over the Sandhu patent in view of Gutsche, the Rostoker '194 patent or the Rotoker '715 patent. The Examiner cited the secondary references for disclosing conventional chemical mechanical polishing. The deficiencies of the Sandhu patent are described in detail

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above. Applicants respectfully request reconsideration of the rejection based on the above and following comments.

The secondary references do not make up for the deficiencies of the Sandhu patent. Therefore, the combined disclosures of the cited references do not establish a prima facie case of obviousness because they do not disclose all of the elements of Applicants' claimed invention. Applicants respectfully request withdrawal of the rejection of claims 1-4, 6, 15 and 23-25 under 35 U.S.C. 103(a) as being unpatentable over the Sandhu patent in view of Gutsche, the Rostoker '194 patent or the Rotoker '715 patent.

#### CONCLUSIONS

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

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#### CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being transmitted by facsimile to the U.S. Patent and Trademark Office, Fax No. 703-872-9310 on the date shown below thereby constituting filing of same.

December 21, 2001  
Date

Peter S. Dardi